UNITED STATES PATENT AND TRADEMARK OFFICE

NC

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,166	10/28/2003	Jose Tellado	TERANETICS-1002-1-US	7162

7590 05/17/2006

Brian R. Short
Teranetics Patent Department
P.O. Box 641867
San Jose, CA 95164-1867

EXAMINER	
CHANG, EDITH M	

ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/695,166	TELLADO ET AL.	
	Examiner	Art Unit	
	Edith M. Chang	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *20051202*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1-25 are objected to because of the following informalities:

Claim 1, line 3: "the digital signal streams" should be "the plurality of digital signal streams";

line 4: "a plurality of the digital signal streams" should be "the plurality of digital signal streams";

line 6: "the transformed digital signal streams" should be "the transformed plurality of digital signal streams";

lines 6-7: "each joint processed digital signal stream" should be "each of the joint processed digital signal streams";

line 7: "digital signal streams;" should be "digital signal streams; and".

Clams 2-25, line 1: "The transceiver" should be "The Ethernet transceiver".

Appropriate correction is required.

2. Claims 10-11 are objected to under 37 CFR 1.75 as being a substantial duplicate of claim 9. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 7: "other digital signal streams" does not clearly indicate which or what other digital signal streams. There are the plurality of digital signal streams, the transformed plurality of digital signal streams and the joint processed digital signal streams, the "other digital signal streams" fails distinctly claim the subject matter.

Claims 2 & 3, line 2: "the digital signal streams" does not clearly indicate which or what other digital signal streams. There are the plurality of digital signal streams, the transformed plurality of digital signal streams and the joint processed digital signal streams, the "other digital signal streams" fails distinctly claim the subject matter.

Claims 11 & 18, line 1: "wherein filtering coefficients of the joint processing" lacks antecedent basis.

Claim 20, line 1: "the digital signal streams" does not clearly indicate which or what other digital signal streams. There are the plurality of digital signal streams, the transformed plurality of digital signal streams and the joint processed digital signal streams, the "other digital signal streams" fails distinctly claim the subject matter.

Claim 4-10, 12-17, 19, and 21-25 are dependent directly or indirectly on the rejected claim 1.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 1, 26 and 27 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. In claims 1, 26 and 27 an Ethernet transceiver comprising a plurality of digital signal streams which is a non-statutory subject matter, the Ethernet transceiver comprising elements, processors etc. structuring the Ethernet transceiver. However, the Ethernet transceiver receives a plurality of digital signal streams, does not comprising signal streams.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1 and 12-41 are rejected under 35 U.S.C. 102(e) as being anticipated by Jones et al. (US 2004/0213146 A1).

Regarding **claims 1, 26, 29 & 39-41**, Jones et al. discloses in Fig.9 an Ethernet LAN bi-directional transceiver and its method ([0003] wherein the Jones et al.'s method and

apparatus in multi-channel communications is in a noteworthy example of 1000BASE-T i.e. Gigabit Ethernet) receiving a plurality of digital signal streams (Rx1 to RxN on 930), at lest one digital signal stream being coupled to another of the plurality of digital signal streams (Fig.1, wherein the interference coupling exists between 1116A & 116B or Fig.3 314 Coupling Effect H(s)), wherein the Fig.9 has elements that were described in previous figures ([0096]) ; the Ethernet transceiver comprising:

A transform block (448 Fig.9) for transforming the plurality of digital signals streams on 930 from the original domain to the frequency domain (a lower complexity domain [0070] wherein the transform unit 416 in Fig.4 i.e. 448 in Fig.9 comprises a Fast Fourier Transform (FFT) unit transferring signal streams into a lower complexity domain);

A processor (704A Fig.9) for joint processing of the transformed plurality of digital signal streams (from 916); and

An inverse transform block (720A of Fig.9, I.T.U. Inverse Transform Unit) for inverse transforming the joint processed signal streams (output of 708A) back to the original domain.

Regarding **claim 12,** inherits the limitations of claim 1, further Jones et al. discloses at least one digital signal stream includes time domain processing (Fig.9 720A Inverse Transform Unit (I.T.U.) processing in time domain).

Regarding **claims 13 & 14,** inherit the limitations of claim 1, further Jones et al. discloses the joint processing (704A Fig.9) of the transformed signal streams is performed on signal streams to be transmitted (Tx1-TxN Fig.9) and on received signal streams (Rx1-RxN on 930 provided by 916 Fig.9).

Regarding **claims 15** & **16,** inherit the limitations of claim 1, further Jones et al. discloses N digital signal streams (Rx1-RxN Fig.9), and M joint processed signal streams (input streams to 704A Fig.9) comprising a single joint processed signal stream.

Regarding **claims 17-19, 30** & **32**, inherit the limitations of claim 1 and claim 29 respectively, further Jones et al. discloses transforming filtering coefficients ([0010], Fig.1 108 Adaptive Canceller) wherein the adaptive canceller 108 is approximately equals H(s) interference coupling effect and is implemented as a digital filter in the discrete time domain to reduce the interference which is the purpose of the canceller.

Regarding **claim 31**, inherits the limitations claim 29, further Jones et al. discloses a transform block (448 Fig.9) for transforming the plurality of digital signals streams on 930 from the original domain to the frequency domain (a lower complexity domain [0070] wherein the transform unit 416 in Fig.4 i.e. 448 in Fig.9 comprises a Fast Fourier Transform (FFT) unit transferring signal streams into a lower complexity domain);

Regarding **claims 20** & **33,** inherit the limitations of claim 1 and claim 29 respectively, further Jones et al. discloses the plurality of digital signal streams are transmitted over an Ethernet network ([0003] wherein the Jones et al.'s method and apparatus in multi-channel communications is in a noteworthy example of 1000BASE-T i.e. Gigabit Ethernet).

Regarding **claims 21-25** & **34-38,** inherit the limitations of claim 1 and claim 29 respectively, further Jones et al. discloses reduction of near end cross talk ([0055] '146), far end cross talk (Fig.2, [0008] '146), alien near end cross talk (Fig.2 '146, wherein interference due to other twisted pair connections that may be proximate to the twisted

pair cable of the interest, [0009] of current specification published as US 2005/0088961 A1), echo signal interference (Fig.1 '146) and inter-symbol interference (Fig.10A 1032, [0110] the last sentence that the 1032 reduce intersymbol interference '146).

Regarding **claims 27** & **28**, Jones et al. discloses in Fig.11 an Ethernet transceiver ([0003] wherein the Jones et al.'s method and apparatus in multi-channel communications is in a noteworthy example of 1000BASE-T i.e. Gigabit Ethernet) receiving a plurality of digital signal streams (Rx1 to RxN on 1120), at lest one digital signal stream being coupled to another of the plurality of digital signal streams (Fig.1, wherein the interference coupling exists between 1116A & 116B or Fig.3 314 Coupling Effect H(s)). The Fig.11 is an embodiment of an adaptive canceller having both analog domain and digital domain cancellation capability ([0048]) and having other details as shown in FIG.9 ([0119]). Hence the Ethernet transceiver comprising:

A transform block (448 Fig.9) for transforming the plurality of digital signals streams on 930 from the original domain to the frequency domain (a lower complexity domain [0070] wherein the transform unit 416 in Fig.4 i.e. 448 in Fig.9 comprises a Fast Fourier Transform (FFT) unit transferring signal streams into a lower complexity domain);

A processor (704A Fig.9) for joint processing of the transformed plurality of digital signal streams (from 916);

An inverse transform block (720A of Fig.9, I.T.U. Inverse Transform Unit) for inverse transforming the joint processed signal streams (output of 708A) back to the original domain; and

an analog front end (1150 Fig.11) for transmitting the joint processed signal streams and receiving analog signal streams from 1124.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 2-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (US 2004/0213146 A1) in view of Hench (US 2006/0023645 A1).

Regarding **claims 2-6,** inherit the limitations of claim 1, in FIG.5 Hench discloses the processing matrix (the pre-processing matrix B 510 & pro-processing matrix A 550, [0097] '645) to pre-whitening the received noise signal across multiple lines ([0057] '645). As Jones et al. multiplying samples of the transformed plurality of digital signal streams (504 Fig.5 i.e. 704 Fig.9 '146) to yields a cyclic convolution ([0081] '146), at the time of the invention was made, it would have been obvious to one of ordinary skill in the art to have the processing matrix adaptively selected to reduce interference noise (comprising ISI [0119] and cross-talk [0096] '645) for the purpose of to reach the maximum data carrying capacity of the channel ([0058]).

Allowable Subject Matter

11. Claims 7-11 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach or suggest, alone or in a combination, among other things, at least the Ethernet transceiver as a whole, the combination of elements and features, which includes the off-diagonal element of the processing matrix are adaptively selected to provide process cross-talk to cancel transmission cross-talk.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M. Chang whose telephone number is 571-272-3041. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed H. Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edith Chang
May 12, 2006

KHAI TRAN
PRIMARY EXAMINER